

What boosts cookstove uptake? A review of behaviour change approaches and techniques

Introduction

The SEI Initiative on Behaviour and Choice aims to generate new knowledge about what drives individual and household behaviour change in the context of adopting new technologies. The overarching objective is to develop and test a conceptual framework that can account for many different drivers of behaviour, and we will draw on empirical data from a series of case studies to build and test the framework. A case study on improved cookstoves in Kenya got under way in 2015.

As a first step in the initiative, we conducted a literature review of various behaviour-change approaches that have been used to understand cookstove adoption, and this brief summarizes the findings of the review. Specifically, we looked at how behaviour-change approaches were used in improved cookstove interventions in developing countries, with a focus on the eight countries prioritised by the GACC (Global Alliance for Clean Cookstoves), which are Bangladesh, China, Ghana, Guatemala, India, Kenya, Nigeria and Uganda. The analysis builds on two recent comprehensive reviews published by Goodwin et al. (2014) and Puzzolo et al. (2014), and gives an update on evidence produced from 2014 to mid-2015. Our review aims to 1) identify theoretical frameworks for behaviour change that are currently being applied in the field of cookstove adoption; and 2) make recommendations for behaviour change techniques (BCTs) that can boost adoption of improved cookstoves (ICS).

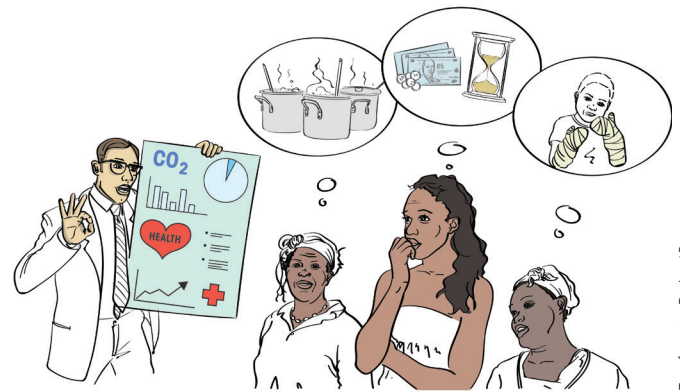
Behaviour change techniques

In this review we define a BCT as the “active component within a clean cooking intervention that helps produce behaviour change to improve human and/or environmental impact.” (Goodwin et al. 2014 p.19). Michie et al. (2013) identified 93 BCTs, which have been statistically factored to reveal 16 core components. Goodwin et al. (2014) have further simplified this to eight core clusters, providing a more manageable framework. These eight clusters are:

- reward and threat
- shaping knowledge
- changing the physical environment
- social support
- goals
- planning and monitoring
- comparisons, identity and belief, and
- regulation.

Methodology

We carried out a literature search of published, peer-reviewed literature from 2014 to mid-2015, replicating the search methods of Goodwin et al. (2014). The review aimed to find out which BCTs were successfully used for adoption of cookstoves, to update the literature, and to suggest improvements in designing these techniques. The search was limited to the Science Direct Database (sciencedirect.com) and the initial search process yielded 64,473 results. To reduce results



Individual behaviour and choice is influenced by a range of factors, such as personal experience, finances, and the advice of peers and experts.

to a more relevant database we decided to shorten the search syntax, which yielded 12,014 results. An initial screening of these indicated many papers were not relevant for our purpose. To make the search even more applicable we limited the syntax to title, abstract, and keywords, which yielded 15 results. These references, together with a special issue on clean cooking initiatives (Rosenthal & Borazzo 2015) form the basis of our review. In total we identified 23 relevant papers. To further complement the academic literature, we also contacted 237 partners of GACC (Global Alliance for Clean Cookstoves) via email to gather BCT experience from grey literature. We received nine relevant responses, which provided case studies from three countries that are discussed below.

Behaviour change techniques evident in the academic literature from 2014 to mid-2015

1. Reward and threat

Financial incentives, fuel costs and availability are consistently reported to be core drivers for sustained adoption of improved cookstoves (ICS). Subsidies to help households buy improved stoves were particularly important in poorer rural communities that traditionally use foraged fuelwood, or charcoal and indigenous low-cost cookstoves. Providing credit to low-income communities to ease their financial burden was also a popular choice. Other incentive programmes included delivering cookstoves free of charge to poorer users.

2. Shaping knowledge

This technique is also consistently used, for example, cooking demonstrations were reported as being important, particularly in relation to sustained usage. Word of mouth communication through influential people – i.e. leaders and government officials, teachers, housewives and business people – was one of the most effective approaches (Rosenbuaum et al. 2015, Clark et al. 2015). Social networks have been found to be most effective where there is reciprocal relationship between individuals (Shankar et al. 2015). The impact of health and environmental messaging is a significant driver of adoption in some contexts

(as suggested by van der Kroon et al. 2014; Shankar et al. 2015), but not for others (Puzzulo et al. 2014, World Bank 2014, Clark et al. 2015). The differences between findings result from factors that vary across contexts, such as sustained and proper use of ICS, availability of foraged fuelwood, cost effectiveness of acquisition, and maintenance of cookstoves.

3. Change to physical environment

Studies revealed that there is a need to better understand housing tenure and design of homes and their impact on cooking and health. Clark et al. (2015) reviewed evidence for physical changes in households and the positive impact that some of these can have on indoor air pollution.

4. Social support

Using a visiting health team as a gateway to adoption is an interesting approach. Furthermore, community sales agents who were trained on household air pollution also played an important role in disseminating the health benefits of ICS (Namegembe et al. 2015). Other strategies include using change agents, community leadership, communities of practice, and outreach workers to generate cultural acceptance of the ICS.

5. Goals, planning and monitoring

Behaviour change goals work well when directed towards individual and household goals, aspirations and lifestyle. One study suggests that men are more interested in ICS if the stove could also charge their mobile phone (Beltramo et al. 2014). In Kenya, fuel choice is connected to social status: for example, use of charcoal indicates a richer family and is often the chosen fuel when cooking for guests (Treiber et al. 2015). To reflect these themes, we suggest this dimension is renamed “goals and aspirations”.

6. Comparisons

This is about providing a choice of options in ICS technology and fuels. The academic literature did not have much evidence of this technique, but we noted its use in the grey literature.

7. Identity and belief

this is about targeting users according to their roles and identity, for example gender roles. We found little evidence of targeted messaging to men and women, but interesting differences between how genders respond suggest that carefully targeted messaging has much potential. An entrepreneurial program that delivered empowerment training for both men and women found sales of ICS doubled across both gender groups, but made the greatest strides in women’s decision making: women outsold men by margin of almost three to one (Shankar et al. 2015). Focusing on intrinsic motivations – what is meaningful for someone – is a key future strategy to be explored.

8. Regulations

None of the literature reviewed reported on regulatory frameworks. Given the importance of structural determinants of behaviour change (i.e. the political, legal and institutional conditions) this is a major omission in the field to date.

The review shows that reward and threat; shaping knowledge; and social support are the most consistently applied BC approaches, but because they are always used in tandem it is hard to separate the impacts of one strategy over another. There is a need for better experimental design so that key variables within an experiment can be isolated.

Behaviour change techniques evident in the grey literature post-2013

In this section, we present findings from grey literature generated since 2013. The information below was provided by selected GACC partners from Bangladesh, Kenya, and Uganda.

Door-to-door visits to potential users were one of the main strategies used in **Bangladesh** for promotional campaigns and creating awareness, and involved innovative marketing approaches, such as trial periods for ICS use; live demonstrations in domestic yards and marketplaces; and ICS subsidies. Shaping knowledge seemed to be a particularly popular BCT. Emphasis was placed on training, sensitization, and communication. For social support, endorsements were mobilised from community leaders and change agents, such as doctors, teachers, and other people of influence. Communities of practice were also urged to share their experience of using ICS with others. Monitoring was ensured with regular after-sale services to deal with problems in order to maintain and expand the customer base. Often organisations used a piggy-back strategy, taking advantage of their existing distribution networks that had a strong local presence. Another favoured strategy was co-design of stoves with users, taking into account their feedback.¹

In **Kenya**, strategies to promote ICS included incorporating users’ views in the design as a process of co-creation, maintaining a strong customer-support mechanism, and ensuring quality standards through constant review and follow-up. A mix of BCTs was used. Shaping knowledge was important, because most of the programmes were found to provide education on the benefits of ICS and arrange training for local artisans to install cookstoves. Sensitisation to the energy saving potential of ICS was also an important strategy. Outreach workers supported cultural acceptance of the ICS, while regular follow-up visits to households to monitor and review quality helped to maintain a strong customer base. Organisations also used cheap and locally available material, and micro-finance institutions offered credit to help low-income users.²

In **Uganda**, an action research project on ICS led a campaign using the slogan “keep my kitchen clean”. The campaign was promoted through radio talk shows, radio drama, bulk texts on mobile phones and toll-free lines, and street art exhibitions. The project also trained youths in the construction and maintenance of improved stoves for poorer households. Social support was built by tasking local government to perform a mediating role, by sensitising and mobilising low-income households, and by ensuring that they made their agreed contribution to providing onsite materials in kind, and providing support and guidance to the local youths who constructed the stoves. The cookstove design was such that local material could be used to reduce the cost. Further, comparisons of the benefits of improved stoves to that of traditional three-stone fires were used to make persuasive arguments for showing clear pros and cons of both technologies to the users.³

To summarize, our literature review finds that there is evidence of a shift in the BCTs towards embedding them within “shaping knowledge” and “social support” approaches. Prior

1 See: www.cleanenergy-bd.org www.idcol.org; and www.ecostoriesbd.com

2 See: www.wisdomstoves.org; www.endev.info/content/Kenya; www.visionfund.org; scode.co.ke/energy-saving-cookstoves; and www.co2balance.com

3 See: www.krcuganda.org

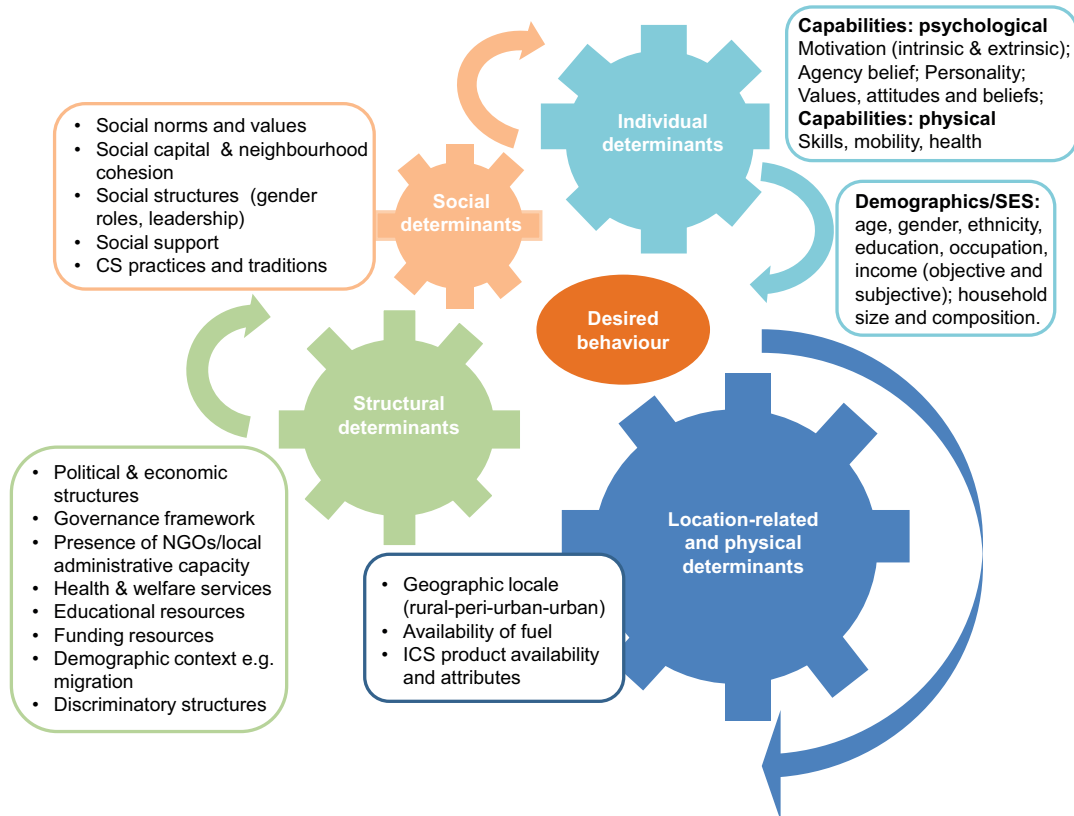


Figure 1: An integrated model of determinants of behaviour change for the clean cooking sector.

to 2013, the focus was largely on rewards, that is, fuel and technology characteristics and financial, tax and subsidy aspects. The grey literature showed a wider diversity of approaches than the academic literature, particularly in relation to social support, for example using change agents and innovative campaigns, and comparative strategies (comparing the benefits and harms of different cookstoves).

Conclusions

An emerging theme in the recent literature centres on the personal, emotional and cultural drivers in decision-making. Research reveals that while cultural practices around cooking and related preferences for fuel do influence improved cookstove (ICS) adoption, the newer cookstoves also impact on the taste of certain foods as well as tasks to be performed. Thus, there is a need for stove designs that take these issues into account.

It is important to tailor messages to specific geographical contexts. The availability of fuel varies by area and season, and so influences the purchase and use of ICS, and the appeal of health messages is different in different locations

and communities. Furthermore, it is important to consider communications across geographic scales, because peer effects are found to be stronger in communities that are geographically and socially close. For example, communication between women at the local level might be more effective for increasing adoption than disseminating information at the regional scale.

Cookstove interventions need to be carefully targeted in terms of gender, particularly from the perspective of women's empowerment and inequalities within the structural context of a culture. Where women are decision-makers in the household, there is a higher demand for improved stoves. On the other hand, men are more aware of the status that can be attached to improved stoves, so ICS adoption may be more successful if features that are more highly valued by men are built into stove design, and highlighted in efforts to disseminate them.

There is a need to further explore the structural determinants of behaviour change, including state regulation, local government administrative capacity, informal governance, discriminatory social relations, and opportunities for interventions, such as regulatory reforms.

Recommendations

The review shows that that behaviour change techniques (BCTs) can operate alongside each other, so there is a need to explore the dynamics and interactions between them within the behaviour-change model, and to extend it, e.g. by including emotional drivers of change, personality dynamics, and changes in social environment (e.g. migration of young adults and its impact on the availability of household labour). We recommend a modified

behaviour change framework (see Figure 1), which reflects the four overarching categories of influence that determine behaviour: individual, social, structural, and locational. The framework also shows the relationships among these categories, recognising that the process of behaviour change is dynamic, and interacts at multiple levels. The framework will be further developed and tested through the SEI Initiative on Behaviour and Choice.

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Women designing a stove in Haryana state, India. Co-design of stoves with users has a substantial impact on uptake.

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